Amendments To The Claims:

Please amend the claims as shown.

1 – 21 (canceled)

22. (new) A method for computer-assisted modeling behavior of a steel volume having a volumetric surface:

resolving a thermal conduction equation and a phase change equation to determine a subsequent state of the steel volume;

operating a computer based on an instantaneous initial state of the steel volume and an instantaneous influence quantity via the volumetric surface on the steel volume, wherein at least one influence quantity includes a local influence for a plurality of surface elements of the volumetric surface and the local influences operate via the relevant surface element on the steel volume;

identifying a local energy content of the steel where the initial state and the determined subsequent state for a number of volume elements of the steel volume comprise local proportions of modeled phases of the steel and a quantity, wherein

the modeled phases of the steel comprise austenite and a first further phase which can transform between austenite and the first further phase, and

the initial state and the determined subsequent state for at least one of the volume elements further comprise a local distribution in concentration of a mobile alloy element in the steel;

determining which concentrations of a mobile alloy element are present on both sides of a first phase boundary between austenite and the first further phase, for a volume element relating to the phase change equation;

resolving a first Stefan problem;

determining, based on the resolution of the Stephan problem, if the distribution in concentration of the at least one mobile alloy element changes in the austenitic zone of the volume element observed and if the first phase boundary is displaced; and

determining the local proportions of the phases based on the position of the first phase boundary defined by the extent of the displacement of the first phase boundary.

23. (new) The method in accordance with claim 22, further comprising a second further phase which can transform between austenite and the second further phase, wherein

determining which concentrations of the mobile alloy element are present on both sides of a second phase boundary between austenite and the second further phase, for a volume element relating to the phase change equation; and

determining, based on the resolution of a second Stephan problem, whether and how a distribution in concentration of the at least one mobile alloy element changes in the austenitic zone of the volume element observed and if the second phase boundary is displaced, wherein:

the first and second Stefan problems are related to each other,

square measures are assigned to the phase boundaries,

a proportion of the square measure assigned to the second phase boundary is determined from the sum of the square measures, and

the local proportions also depend on the proportion of the square measure assigned to the second phase boundary in the sum of the square measures.

24. (new) The method in accordance with claim 23, wherein the proportion of the square measure assigned to the second phase boundary in the sum of the square measures is determined such that the phase boundaries remain arranged alongside one another.

25. (new) The method in accordance with claim 23, wherein the proportion of the square measure assigned to the second phase boundary in the sum of the square measures is adjusted such that the phase boundaries move towards each other.

26. (new) The method in accordance with claim 25, wherein it is determined whether austenite changes only in the first further phase, only in the second further phase or both in the first and also in the second further phase based on the proportion of the square measure assigned to the second phase boundary of the sum of the square measures it.

27. (new) The method in accordance with claim 26, wherein:

the volume element observed is a cuboid and has three basic dimensions,

the first phase boundary is a rectangle with a first longitudinal side and a first transverse side where the first longitudinal side corresponds to one of the cuboid basic dimensions, the first transverse side is parallel to a second of the cuboid basic dimensions and displacements of the first phase boundary are parallel to the third cuboid basic dimension.

28. (new) The method in accordance with claim 27, wherein the second phase boundary is a rectangle having a second longitudinal side and a second transverse side where the second longitudinal side corresponds to a first cuboid basic dimension, the second transverse side extends parallel to a second cuboid basic dimension and displacements of the second phase boundary occur in parallel to a third cuboid basic dimension.

29. (new) The method in accordance with claim 28, wherein the sum of the transverse sides of the phase boundaries is 1.5 to 3 times a critical lamella spacing where an energy balance considers:

the phase changes of the steel corresponding to the displacement of the phase boundaries, and

the changes in the surface of a boundary layer between the first and the second further phase corresponding to the displacement of the phase boundaries.

30. (new) The method in accordance with claim 29, wherein the first and second Stefan problems are:

formulated and resolved in one dimension, or

the proportion of austenite is determined on the basis of a non-linear function of the location of the phase boundaries.

31. (new) The method in accordance with claim 30, wherein the concentrations where at least one mobile alloy element is present on both sides of the first phase boundary or on both sides of the first and second phase boundary are determined on the basis of the Gibbs free enthalpies of the phases.

32. (new) The method in accordance with claim 31, further comprising determining whether both austenite and the first further phase are present or whether in addition to austenite and the first further phase, the second further phase is also present based on the phases present in the initial state and on the basis of the Gibbs free enthalpies of the phases.

33. (new) The method in accordance with claim 32, wherein the steel volume comprises a plurality of volume elements and the Stefan problems are resolved for a sub-portion of the volume elements and the local proportions of the phases of the remaining volume elements are determined based on the local proportions of the phases of the sub-portion of the volume elements.

34. (new) The method in accordance with claim 33, wherein the thermal conductance equation is resolved for each volume element.

35. (new) The method in accordance with claim 22, further comprising:

specifying a first state and a desired end value to the computer,

applying the modeling method iteratively where the instantaneous initial state of a first iteration corresponds to the first state and subsequent initial states of further iterations correspond to the subsequent state previously determined,

determining an expected end quantity based on the subsequent state determined after a last iteration, and

comparing the expected end quantity with the desired end quantity.

36. (new) The method in accordance with claim 35, wherein a plurality of influence quantities of the iterations correspond to an influence quantity sequence where the computer varies the influence quantity sequence based on the comparison of the expected end quantity with the desired end quantity until the expected end quantity corresponds to the desired end quantity.

37. (new) The method in accordance with claim 36, wherein the method is executed online and in real time and within each iteration:

the computer determines the influence quantity based on an initial quantity determined from the initial state and a desired subsequent quantity and

the computer activates an influencing device where the steel volume is influenced according to the determined influence quantity.

38. (new) An a steel volume influencing system, comprising:

a digital mass storage device for storing a computer program;

a computer connected to the mass storage device for execution of the computer program where the program:

resolves a thermal conduction equation and a phase change equation to determine a subsequent state of the steel volume based on an instantaneous initial state of the steel volume and an instantaneous influence quantity via the volumetric surface on the steel volume, wherein at least one influence quantity includes a local influence for a plurality of surface elements of the volumetric surface and the local influences operate via the relevant surface element of the steel volume,

identifies a local energy content of the steel volume where the initial state and the determined subsequent state for a number of volume elements of the steel volume comprise local proportions of modeled phases of the steel and a quantity, wherein

the modeled phases of the steel comprise austenite and a first further phase which can transform between austenite and the first further phase, and

the initial state and the determined subsequent state for at least one of the volume elements further comprise a local distribution in concentration of a mobile alloy element in the steel,

determines which concentrations of a mobile alloy element are present on both sides of a first phase boundary between austenite and the first further phase, for a volume element relating to the phase change equation,

resolves a first Stefan problem,

determines, based on the resolution of the Stephan problem, if the distribution in concentration of the at least one mobile alloy element changes in the austenitic zone of the volume element observed and if the first phase boundary is displaced,

determines the local proportions of the phases based on the position of the first phase boundary defined by the extent of the displacement of the first phase boundary, and

determines an influence quantity based on an initial quantity determined from the initial state and a desired subsequent quantity, and

generates an influencing signal according to the determined influence quantity; and

an influencing device that receives the influencing signal from the computer and influences the temperature of the steel volume.

39. (new) The system as claimed in claim 38, wherein the influencing device is a cooling line located within a steel production facility.